Statistics 315/DSCI 301 – Probability and Statistics for Data Science
Fall 2020

Week#	Topics*	Textbook
1	Course overview; Sets and counting. Axioms of Probability; Rules of Probability. Conditional probability	1: 1,2 1.3
2	Equally likely outcomes. Conditional probability. Bayes theorem; independence	1: 1, 3, 4, 5
3	Random variables. Discrete rv's. Probability Mass Function (PMF). Uniform, Binomial, Hypergeometric, Poisson. Statistical Expectation. Mean, variance, SD	2: 1, 4, 6 2: 2, 3
4	Continuous rv's and Probability Density Function (PDF). Mean, Variance, Percentiles. Uniform distribution. Exponential distribution. Normal/Gaussian distribution.	3: 1 3.2 (95-98) 3.3
5	Gamma and Chi-square distributions.	3.2
6	Transformations Catch-up	5.1
7	Statistics, Several random variables; Independent rvs; **EXAM 1, Thur, October 8**	5.3 Material thru transformations, inclusive. Details TBA.
8	Moment generating function (MGF); Sampling Distributions	2.3 and 3.1 (MGF discussions) 5.4-5.5
9	Central Limit Theorem; Law of Large Numbers Statistical Inference. Point Estimation and Standard errors. Maximum likelihood estimation	5.6 6.1, 6.2 6.4
10	CI for a single mean: μ CI for difference of two means: $\mu_1 - \mu_2$ Sample size for means	7.1 7.2 7.4
11	CI for single Binomial proportion: p CI for difference of two proportions: $p_1 - p_2$ Sample size for proportions	7.3 7.4
12	Hypothesis Testing for single mean: $\mu = \mu_0$ Hypothesis Testing for equality of two means: $\mu_1 = \mu_2$	8.1 8.2
13	Testing for single proportion: $p = p_0$ Testing for equality of two proportions: $p_1 = p_2$	8.3
14	No Class – Thanksgiving Week	

15	No Class – Independent Study	
Dec 8-10	Finals Week – **Exam 2**	Not comprehensive. Material since Exam 1 covered. Details TBA.

#Due to Covid-19, classes in the Fall 2020 semester will end the Friday before Thanksgiving.
*Subject to change by instructor.